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Section 3. Amendment to the drawings

5 A replacement sheet of drawings is included with this reply. The conduit formerly labeled 28 (as a duplicate) has been relabeled as 128. The specification is amended accordingly.

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Section 4. Affirmation of Election

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Confirming a prior telephonic election made on June 18, 2007, Applicant elects Group 1, defined by examiner to include claims 1-27. Claims 28-33 are therefore withdrawn from consideration in the instant application.



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Section 5. Response to the Office regarding Section 102 claims rejections

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Examiner suggests that selected claims of the instant application are anticipated by US 3,674,945, issued on July 4, 1972 to inventor E. Hands (Hands '945). Examiner further suggests that selected claims of the instant application are anticipated by US 5,664,456 to inventor M. Eckert, of issue date Sept. 9, 1997 (Eckert '456). Examiner further suggests that
10 selected claims of the instant application are anticipated by US 6,166,998, which issued on Dec. 26, 2000 to inventor Hare (Hare '998). It is instructive to consider these three patents as a group, because they share characteristics that are different from the current invention.

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All three of these transducers are directed toward air transducers. The current invention is directed toward an invention that is to be used in a liquid, specifically water. It is well known in the art that water is a much more efficient carrier of sound energy than is air.

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Perhaps non-intuitively, the result of this difference is that an acoustic ultrasonic device configured for water service is advantageously much more powerful than one configured for air service. The reason for this is that the device of the current invention is configured to image targets, such as a school of fish, at large distances, perhaps hundreds of meters. In contrast, an air transducer is only effective at limited distances. If too much energy were input to an air transducer, the noise produced would overwhelm any useful return signal. Thus, the inventions of Hands '945, Eckert '456, and Hare '998 lack any means to step up
25 power to the ultrasonic transducer.

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In contrast, the current invention comprises a transformer and capacitor array to step up the power to the transducer. Even in water service, it is important to avoid hull or other noise, and attenuation of signal due to the hull and the water. To avoid these problems, the current invention envisages impedance matching via an acoustic block and other means (eg, glue).



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5 The inventions of Hands '945, Eckert '456, and Hare '998 lack this type of impedance matching, because their inventions are not directed toward use in water, and thus have much lower power than the current invention. Transformers and capacitors are lacking in these inventions. They do not share the same elements as the current invention, they are not suitable for the same function of water imaging, and thus should not be considered as anticipating the current invention.

10 The Applicant notes that the specific elements of transformer and capacitor, resulting in the larger power, are now recited in amended Claim 1, to emphasize the distinction from the prior art.

15 Examiner further suggests that claim 21 of the instant application is anticipated by US 5,038,067, issued on August 6, 1991 to inventor J. Tabin (Tabin '067). This patent differs from the other prior art cited by the Examiner in that the Tabin '067 does include a transformer, as noted by Examiner. However, Tabin uses the transformer in a much different way than does the current invention.

20 Tabin '067 describes the transformer in lines 60-68 of Column 3. Tabin uses the transformer to energize piezoelectric elements for vibration in an axial mode at the selected frequency. In essence, the transformer is part of the 'focusing' of the ultrasonic transducer.

25 In contrast, Applicant uses the transformer in connection with a capacitor to 'step up' the power output of the transducer, as required in water service. See above discussion and paragraph 20 in the current application. Thus, Tabin '067 teaches away from the current invention.

30 None of the prior art anticipates water service. Therefore, none of the prior art can be expected to teach about impedance matching to an aluminum hull of a boat. Indeed, they do not. Thus, none of the prior art devices could effectively function in the service for which the current invention is designed and in fact does function.



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In summary, then: none of the prior art references proposed by examiner suggest or accommodate a transformer and capacitor power amplification as used in the current invention. Applicant therefore suggests that the cited prior art no longer can be used as a basis for rejection of the instant application under 35 U.S.C. 102. Therefore, Applicant requests Examiner to remove the novelty rejections in light of the above considerations.

Section 6. Response to the Office regarding Section 102 claims rejections

Examiner suggests that selected claims of the instant application are rendered by any of the above prior art publications in light of US 4,206,436, issue date of June 3, 1980 to inventors J. Grunert et. al. (Grunert '436). This is a curious reference in that it is not directed to acoustic transducers. Instead, it is directed to phenolic insulation for a variety of electrical devices. In such general service, acoustic matching is impossible to achieve, or indeed to even teach. With this in mind, and in light of the above arguments, Applicant requests that the Examiner withdraw the holding of obviousness in light of the lack of enablement in the Grunert '436 patent for service of the type for which the current invention is designed.



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Remarks

5 The claims have been amended to narrow the scope and avoid the rejections based on prior art cited by the Examiner.

Every effort has been made to constructively amend each area of the claims and specification in accordance with all of the examiner's observations in the above-referenced Office Action. Accordingly, applicant respectfully requests a timely Allowance in this case.

Respectfully Submitted,

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